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AUTHOR Bowman, Harry L; And Others
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ABSTRACT

A study investigated the reading comprehension and educationally related characteristics of the United States Navy's recruit population based on data for selected variables. The variable of primary interest was the recruit's grade level score on reading comprehension; other variable employed in the study were grade level score, years of education, aptitude score, high school graduation status, and month of entry into the navy. Subjects, 66,296 recruits who entered the navy between June 1988 and May 1989, took the Gates-MacGinitie Reading Comprehension Tests and the Armed Services Vocational Aptitude Battery. Results indicated that: (1) the typical navy recruit has completed slightly less than 12 years of education; (2) the mean reading comprehension score placed the composite group near the tenth grade level and the median near the twelfth grade level; and (3) higher percentages of the recruits who scored below the 6.0 reading grade level were high school graduates in the earlier months of the period. Findings suggest that the recruit population remained relatively stable, showing little variability during recent years with regard to means on years of education, reading comprehension skills, and aptitude scores. Findings also suggest that factors for which distributions by month differ include reading grade level scores, high school graduation status, and high school graduation status of recruits who score below the 6.0 reading grade level. (Nine tables of data are included; 24 references are attached.) (RS)

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U.S. NAVY RECRUIT CHARACTERISTICS ON READING COMPREHENSION AND EDUCATIONALLY RELATED VARIABLES: A TWELVE-MONTH PROFILE FROM JUNE, 1988, TO MAY, 1989

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Harry L. Bowman
College of Education
Memphis State University
Memphis, Tennessee 38152

Paul L. Jones
Emily J. Webb
Chief of Naval Technical Training
Naval Air Station Memphis
Millington, Tennessee 38054

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Introduction

Although the Department of the Navy initiated programs designed to remediate deficiencies in academic skills among selected personnel as early as the World War II era in the 1940s, the first official policy on remedial training in basic skills was issued by the Secretary of the Navy on 2 June 1978. The policy included the following statement: "It is the policy of the Department of the Navy to provide, when indicated, on-duty remedial job-relevant basic skills training in order to fill personnel requirements" (SECNAVINST 1510.3, 1978, p. 1). [Job-relevant basic skills are defined as "those capabilities prerequisite to efficient completion of Navy training programs, adequate job performance and career advancement. Notable among these are literacy, study and computational skills" (p. 1).] In addition to new programs being developed as a result of the policy statement, fundamental skills training programs that were already operational were given formally recognized status by the Department of the Navy. One operational program, Academic Remedial Training (ART), provides instruction for recruits in basic reading and study skills as well as verbal skills needed to complete the demanding academic requirements of recruit training.

The ART Program was implemented officially in 1967 by the Naval Technical Training Command at each of the Navy's three Recruit Training Centers as a remedial reading course. The courses at the three sites utilized different curricula and testing plans due to the autonomy permitted in course development. Eventually, the Chief of Naval Technical Training recognized a need for a standardized curriculum and testing plan that were prescribed and implemented in 1978 (CNTECHTRAINST 1540.42). The scope of the curriculum included both reading and study skills (Chief of Naval Technical Training, 1978; Chief of Naval Technical Training, 1979; Bowman, Kaiser, Jones, & Petry,

1984). A verbal skills curriculum that focuses on listening and speaking skills, primarily for recruits whose native language is not English, was added to the program at the Orlando and San Diego Recruit Training Centers in 1981 and the Great Lakes Recruit Training Center in 1985 (Chief of Naval Technical Training, 1980; Bowman, Kaiser, & Sherman, 1986).

The commitment of the Navy to provide fundamental skills training for enlisted personnel was reiterated through a policy statement by the Chief of Naval Operations in 1982. Specific skills identified for remediation were reading, mathematics, and communication skills (OPNAVINST 1510.11, 1992, p. 1). The policy states also that "A major goal of enlisted fundamental skills training is to achieve a minimum reading competency of the ninth grade" (p. 1).

Historically, the singular purpose of ART has been to assist recruits in acquiring the language skills required to complete recruit training successfully. While the ultimate purpose remains the same, the addition of the verbal skills component to the program expanded the scope of remediation to include listening and speaking skills of recruits who are primarily speakers of English as a second language. The population served by the program has been delimited to enlisted personnel who have not begun recruit training or have encountered academic difficulty after beginning recruit training.

The implementation of the standardized ART reading curriculum required the use of a Computer-Managed Instruction (CMI) system to perform test scoring functions. The CMI system is utilized to score the screening and diagnostic tests employed in the program. A product of using the CMI system for test scoring is a database on the reading comprehension skill levels and educationally related characteristics of all Navy recruits. Monthly reports on the educational, aptitudinal, and reading characteristics of all recruits who begin training are routinely prepared and distributed to ART Program management

personnel.

Problem

The problem defined for this study was to describe the reading comprehension and educationally related characteristics and relationships among selected variables that describe the Navy's recruit population. The recruits who entered the Navy between June, 1988, and May, 1989, were the subjects who provided the data to address the problem. The variable of primary interest was the recruit's grade level score on reading comprehension. Other variables employed in the study were years of education, aptitude score, high school graduation status, and month of entry into the Navy.

Hypotheses

After performing descriptive analyses of the data on selected variables, six null hypotheses were tested statistically to identify differences among recruits on particular variables. The hypotheses tested were the following:

1. There are no differences in the distributions of recruits classified by reading grade level (RGL) category and month of entry into the Navy.
2. There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy.
3. There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy.
4. There is no difference in the distributions of non-high school graduate recruits classifed by the 6.0 RGL criterion and month of entry into the Navy.
5. There is no difference in the distributions of recruits scoring below

the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy.

6. There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion.

The .05 level of significance was used in testing the hypotheses.

The importance of the study is based on two considerations. First, the analyses could identify factors on which the recruit population varies across a 12-month period. Such information would be useful to ART Program management personnel in planning for more efficient allocation and utilization of resources (e.g. staff, facilities, and instructional materials). In particular, variablity in the numbers of recruits who need remediation in language skills would have a direct effect on the requirements for staffing and instructional materials. Second, this study could demonstrate the feasibility of using CMI system data to monitor and manage the ART Program. Since these data are reported routinely to program management personnel, the data are readily available to use in making decisions on program needs and operations.

Related Research

Many research studies have been conducted on the reading skill levels of Navy enlisted personnel and training materials because of the importance of reading skills for success in training and job performance. Hoiberg, Hysham, and Berry (1974) reported a significant relationship between reading skills and successful completion of the first enlistment term in the Navy. Biersner (1975) found that many Navy training manuals are written at the 12th grade reading ability level or higher. Zierdt (1976) and Sticht (1982) concluded that the reading abilities of many recruits do not meet the skill requirements of widely used Navy materials.

Several studies have described the reading skill levels of the Navy recruit population based on the Gates-MacGinitie Reading Tests. Duffy and Nugent (1978) found a median RGL of 11.9 on comprehension as a result of testing 31,575 recruits at the Recruit Training Center in San Diego between May, 1974, and May, 1975. The data showed that 2.8% of the recruits scored below the 4.0 RGL and 9.6% scored below the 6.0 RGL. They concluded that the reading skill levels of many recruits are well below the readability levels of the print materials used in recruit training and daily job tasks.

Bowman and Kerr (1979) reported that a sample of 14,503 recruits tested in the first few months of 1979 had a median RGL of 11.0 on comprehension while 1.1% scored below the 4.0 RGL and 5.2% scored below the 6.0 RGL. In a one-year study (1981), they found that 79,350 recruits who entered the Navy between June, 1980, and May, 1981, had a median RGL of 11.0 on comprehension with .7% scoring below the 4.0 RGL and 4.3% scoring below the 6.0 RGL. In a subsequent study (1982) based on 84,123 recruits who entered the Navy between June, 1981, and May, 1982, they reported a median RGL of 11.2 while .5% scored below the 4.0 RGL and 3.6% scored below the 6.0 RGL. They found in their next study (1983) on 77,347 recruits who entered the Navy between June, 1982, and May, 1983, that the median RGL was 11.4 with .9% scoring below the 4.0 RGL and 3.8% scoring below the 6.0 RGL. Kerr, Bowman, and Darcy (1984) indicated in a study on 67,740 recruits who entered the Navy between June, 1983, and May, 1984, that the median RGL was 12.1 with .7% scoring below the 4.0 RGL and 2.9% scoring below the 6.0 RGL. In a later study by Bowman and Kerr (1985), the data on 77,674 recruits who entered the Navy between June, 1984, and May, 1985, revealed a median RGL of 12.0 with .7% of the recruits scoring below the 4.0 RGL and 3.0% scoring below the 6.0 RGL. Bowman, Kerr, and Webb (1986) reported subsequently on a study of 82,531 recruits who entered the Navy between June,

1985, and May, 1986, that the median RGL was 11.9 with .7% of the recruits scoring below the 4.0 RGL and 2.9 % scoring below the 6.0 RGL. A more recent study by Bowman and Webb (1987) of 79,087 recruits who entered the Navy between June, 1986, and May, 1987, revealed a median RGL of 12.0 with 3.5% scoring below the 6.0 RGL. The most recent study by Bowman, Jones, and Webb (1989) based on 76,177 recruits entering the Navy between June, 1987, and May, 1988, reported a median RGL of 11.9 with 3.7% scoring below the 6.0 RGL.

The research studies indicate that reading skills are strongly related to the success of Navy enlisted personnel while the readability levels of many training and job materials are very demanding with respect to the skill levels required for their use. Descriptive research data reveal that the reading comprehension levels of recruits declined between 1974-75 and 1979. Later studies suggest that the median reading comprehension level of recruits has increased after a brief period of stability at approximately the 11th grade level.

Procedures

The data utilized in this study were obtained from the monthly CNI reports on Navy recruit characteristics and test performance. Data were available on 66,296 recruits who entered the Navy between June, 1988, and May, 1989. The reports provided data on four variables used in this study: years of education, high school graduation status, aptitude test scores, and reading comprehension grade level scores. A fifth variable, month of entry into the Navy, was defined by the month for which each report was prepared.

The Gates-MacGinitie Reading Comprehension Test (1978), hereafter called the Gates, and the Armed Services Vocational Aptitude Battery (1967-84) are the two tests for which data were reported. The Gates, Levels D, E, or F, is utilized as a screening test for all recruits who enter the Navy. An

algorithm is used with the paragraph comprehension and verbal expression scores for the Armed Services Vocational Aptitude Battery to estimate the reading skill level of each recruit and to assign the appropriate level of the Gates. During the time period covered by this study, the recruits who scored below the 8.0 RGL on the first administration of the Gates were retested with an alternate form of Level D. (The data from the first administration of the Gates are used in this study.) All recruits who scored below the 6.0 RGL on the second administration of the Gates were assigned to ART. (Recruits may also be assigned to ART if they score between the 6.0 and 8.0 RGL or encounter academic difficulties during recruit training.)

The Armed Services Vocational Aptitude Battery (ASVAB) is administered to all recruits before they enlist in the Navy. The recruits included in this study had taken one of two series of ASVAB tests: Series 8-10 or Series 11-14. The aptitude score used in the study was the Armed Forces Qualification Test (AFQT) score. The AFQT is a normative percentile score that is derived from a composite of selected ASVAB scores.

The monthly CMI reports provided means for years of education, AFQT scores of recruits classified by the 6.0 RGL criterion (above or below), and RGL scores. The median was calculated for RGL scores by month. Frequency distributions were compiled and percentage distributions were computed for all recruits on RGL categories, high school graduation status, and combinations of the variables on high school graduation status and the 6.0 RGL criterion. Proportions were calculated for high school graduate and non-high school graduate recruits who scored below the 6.0 RGL criterion.

A tabular format was used to present the means and medians as descriptive statistics. The Chi-square technique and confidence limits for differences in proportions were employed for the analyses related to testing the hypotheses.

The Chi-square procedure provided comparisons of frequency distributions for RGL scores, high school graduation status, and the 6.0 RGL criterion and high school graduation status by month of entry into the Navy. Confidence interval limits were computed to compare the proportions of high school graduates and non-high school graduates who scored below the 6.0 RGL by month and composite group.

Results

The results of the study are reported in a series of nine tables. The descriptive data are depicted in the first three tables. The remainder of the tables present the data and results of the inferential analyses related to the hypotheses.

Descriptive Data

Table 1 contains the means on years of education by month of entry into the Navy for the recruits. The composite mean for the one-year time period was 11.9 years of education. The monthly means varied by only two months from 11.8 to 12.0 years. Means of 12.0 years occurred for two months--June and September, 1988.

The means presented in Table 2 are derived from the AFQT percentile scores of recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The composite means were 37.1 for all recruits who scored below the 6.0 RGL and 57.2 for all recruits who scored above the 6.0 RGL. Among the recruits with RGL scores below 6.0, the monthly means ranged from 32.0 in May, 1989, to 40.4 in June, 1988. Among the recruits with RGL scores above 6.0, the monthly means varied from a low of 55.4 in October, 1988, to a high of 60.3 in December, 1988. The differences in the means for the low and high RGL groups were about 20 percentile points for the composite means and ranged from about

TABLE 1

MEANS ON YEARS OF EDUCATION FOR RECRUITS BY MONTH OF ENTRY

Month	N	Mean
June, 1988	7,990	12.0
July, 1988	8,682	11.9
August, 1988	9,460	11.9
September, 1988	9,293	12.0
October, 1988	4,954	11.9
November, 1988	6,249	11.9
December, 1988	4,275	11.9
January, 1989	5,404	11.9
February, 1989	3,663	11.9
March, 1989	2,609	11.9
April, 1989	2,063	11.9
May, 1989	1,650	11.9
TOTAL	66,292	11.9

TABLE 2

MEANS ON THE ARMED FORCES QUALIFICATION TEST SCORES FOR RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

Month	Reading Grade Level Criterion			
	Below 6.0		Above 6.0	
	N	Mean	N	Mean
June, 1988	345	40.4	7,645	59.5
July, 1988	334	37.1	9,349	56.4
August, 1988	398	35.9	9,071	56.3
September, 1988	351	37.0	9,942	55.6
October, 1988	194	36.5	4,761	55.4
November, 1988	217	38.4	6,032	59.9
December, 1988	158	37.6	4,117	60.3
January, 1989	195	36.8	5,220	59.2
February, 1989	124	34.4	3,539	56.9
March, 1989	97	35.3	2,512	57.1
April, 1989	99	35.3	1,974	56.4
May, 1989	45	32.0	1,605	57.1
TOTAL	2,527	37.1	63,769	57.2

17 to 25 points by month. The differences between the low and high RGL groups were relatively stable during the 12-month period.

The medians and means for RGL of recruits by month of entry into the Navy are reported in Table 3. The median for the composite group was 11.5 RGL while the mean was 9.7 RGL. The monthly medians ranged from 11.1 RGL in October, 1988, to 12.0 RGL in 5 of the 12 months. The means by month varied from a low of 9.6 RGL in September, 1988, and April, 1989, to a high of 9.9 RGL in May, 1989. The monthly medians and means did not reveal appreciable variability during the one-year time period.

Hypothesis 1

There are no differences in the distributions of recruits classified by RGL category and month of entry into the Navy. Table 4 presents the frequency and percentage distributions of recruits by RGL category and month of entry. The data on the composite group for the one-year period showed that 3.81% of the recruits had scores below the 6.0 RGL criterion--the criterion for mandatory referral to ART during this time period. The percentage of recruits who scored below the 6.0 RGL varied considerably among the 12 months as evidenced by a range from 2.73% in May, 1989, to 4.32% in June, 1988. The percentage of recruits who scored at or below the 8.0 RGL was 16.14% for the year with a monthly low of 13.52% in May, 1989, and a monthly high of 17.87% in October, 1988. While 83.86% of the composite group had RGL scores above 8.0, the monthly percentages ranged from 82.14% in October, 1988, to 86.48% in May, 1989. The Chi-square comparison of the RGL distributions of recruits by month of entry revealed significant differences across the 12 months, thereby leading to rejection of the null hypothesis tested at the .05 level of significance.

TABLE 3

MEDIANS AND MEANS ON READING GRADE LEVEL FOR RECRUITS
BY MONTH OF ENTRY

Month	N	Median	Mean
June, 1988	7,990	11.6	9.7
July, 1988	8,683	11.3	9.7
August, 1988	9,461	11.2	9.7
September, 1988	9,293	11.2	9.6
October, 1988	4,955	11.1	9.7
November, 1988	6,249	12.0	9.8
December, 1988	4,275	12.0	9.8
January, 1989	5,405	12.0	9.8
February, 1989	3,663	11.6	9.7
March, 1989	2,609	12.0	9.8
April, 1989	2,063	11.9	9.6
May, 1989	1,650	12.0	9.9
TOTAL	66,296	11.5	9.7

TABLE 4

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY READING GRADE LEVEL AND MONTH OF ENTRY

Month	Reading Grade Level Category						
	6.0 or below		6.1-8.0		Above 8.0		Total
	f	%	f	%	f	%	f
June, 1988	345	4.32	986	12.34	6,659	83.34	7,990
July, 1988	334	3.85	1,125	12.96	7,224	83.20	8,683
August, 1988	388	4.10	1,260	13.32	7,813	82.58	9,461
September, 1988	351	3.78	1,233	13.27	7,709	82.95	9,293
October, 1988	194	3.92	691	13.95	4,070	82.14	4,955
November, 1988	217	3.47	705	11.28	5,327	85.25	6,249
December, 1988	158	3.70	453	10.60	3,664	85.71	4,275
January, 1989	185	3.42	571	10.56	4,649	86.01	5,405
February, 1989	124	3.39	449	12.26	3,090	84.36	3,663
March, 1989	97	3.72	269	10.31	2,243	85.97	2,609
April, 1989	89	4.31	252	12.22	1,722	83.47	2,063
May, 1989	45	2.73	178	10.79	1,427	86.48	1,650
TOTAL	2,527	3.81	8,172	12.33	55,597	83.86	66,296

Chi-square = 103.589 (Chi-square = 33.924, df = 22, level of significance = .05)

Hypothesis 2

There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions of recruits classified by high school graduation status are reported in Table 5. The data revealed that about 91% of the recruits were high school graduates. The percentages of high school graduates were relatively higher during June - September, 1988. The lowest percentage was in April, 1989. The comparison of the frequency distributions of recruits on high school graduation status by month of entry utilizing the Chi-square procedure indicated that the distributions differed very significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 3

There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. Table 6 contains the frequency and percentage distributions of high school graduate recruits by the 6.0 RGL criterion and month of entry. The data for the composite group indicated that 3.91% of the high school graduate recruits scored below the 6.0 RGL on comprehension. The monthly percentages varied from a low of 2.75% in May, 1999, to a high of 4.36% in April, 1989. The percentages tended to be relatively comparable during most months of the 12-month period. The results of the Chi-square comparison of the frequency distributions for high school graduate recruits by the 6.0 RGL criterion and month of entry showed that they did not differ significantly at the .05 level of significance. Consequently, the null hypothesis of no difference in the distributions was not rejected.

TABLE 5

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				
	Yes		No		Total
Month	f	%	f	%	f
June, 1988	7,485	93.68	505	6.32	7,990
July, 1988	8,173	94.14	509	5.86	8,682
August, 1988	8,960	94.71	500	5.29	9,460
September, 1988	8,890	95.66	403	4.34	9,293
October, 1988	4,323	87.26	631	12.74	4,954
November, 1988	5,326	85.23	923	14.77	6,249
December, 1988	3,678	86.04	597	13.96	4,275
January, 1989	4,767	88.21	637	11.79	5,404
February, 1989	3,230	88.18	433	11.82	3,663
March, 1989	2,261	86.66	348	13.34	2,609
April, 1989	1,699	82.36	364	17.64	2,063
May, 1989	1,380	83.64	270	16.36	1,650
TOTAL	60,172	90.77	6,120	9.23	66,292

Chi-square = 1,453.725 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 6

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF HIGH SCHOOL GRADUATE RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

	Reading Grade Level Criterion				
	Below 6.0		Above 6.0		Total
Month	f	%	f	%	f
June, 1988	324	4.33	7,161	95.67	7,485
July, 1988	317	3.88	7,856	96.12	8,173
August, 1988	368	4.11	8,592	95.89	8,960
September, 1988	339	3.81	8,551	96.19	8,890
October, 1988	178	4.12	4,145	95.88	4,323
November, 1988	189	3.55	5,137	96.45	5,326
December, 1988	146	3.97	3,532	96.03	3,678
January, 1989	174	3.65	4,593	96.35	4,767
February, 1989	117	3.62	3,113	96.38	3,230
March, 1989	88	3.89	2,173	96.11	2,261
April, 1989	74	4.36	1,625	95.64	1,699
May, 1989	38	2.75	1,342	97.25	1,380
TOTAL	2,352	3.91	57,820	96.19	60,172

Chi-square = 14.408 (Chi-square = 19.68, df = 11, level of significance = .05)

Hypothesis 4

There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The frequency and percentage distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry are depicted in Table 7. In the composite group, 2.86% of the recruits who were not high school graduates scored below the 6.0 RGL on comprehension. The monthly percentages varied from a low of 1.62% in February, 1989, to a high of 4.16% in June, 1988. The percentages were highly variable among the 12 months without any clearly discernible pattern. The Chi-square comparison of the frequency distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry revealed that they did not differ significantly at the .05 level of signficance. Thus, the null hypothesis that the distributions are not different was not rejected.

Hypothesis 5

There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions are reported in Table 8 for the recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry. The data showed that 93.07% of the recruits who obtained scores below the 6.0 RGL on comprehension were high school graduates. The monthly percentages ranged from 83.15% in April, 1989, to 96.58% in September, 1988. The percentages tended to be higher in the earlier months and variably lower and higher in the latter months of the 12-month period. The comparison of the frequency distributions of recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry using the Chi-square technique revealed that they differed

TABLE 7

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF NON-HIGH SCHOOL GRADUATE RECRUITS BY SIXTH GRADE LEVEL CRITERION AND MONTH OF ENTRY

	Reading Grade Level Criterion				
	Below 6.0		Above 6.0		Total
Month	f	%	f	%	f
June, 1988	21	4.16	484	95.84	505
July, 1988	17	3.34	492	96.66	509
August, 1988	20	4.00	480	96.00	500
September, 1988	12	2.98	391	97.02	403
October, 1988	16	2.54	615	97.46	631
November, 1988	28	3.03	895	96.97	923
December, 1988	12	2.01	585	97.99	597
January, 1989	11	1.73	626	98.27	637
February, 1989	7	1.62	426	98.38	433
March, 1989	9	2.59	339	97.41	348
April, 1989	15	4.12	349	95.88	364
May, 1989	7	2.59	263	97.41	270
TOTAL	175	2.86	5,945	97.14	6,120

Chi-square = 15.395 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 8

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				
	Yes		No		Total
Month	f	%	f	%	f
June, 1988	324	93.91	21	6.19	345
July, 1988	317	94.91	17	5.19	334
August, 1988	368	94.85	20	5.15	388
September, 1988	339	96.58	12	3.42	351
October, 1988	178	91.75	16	8.25	194
November, 1988	189	87.10	28	12.90	217
December, 1988	146	92.41	12	7.59	158
January, 1989	174	94.05	11	5.95	185
February, 1989	117	94.35	7	5.65	124
March, 1989	88	90.72	9	9.18	97
April, 1989	74	83.15	15	16.85	89
May, 1989	38	84.44	7	15.56	45
TOTAL	2,352	93.07	175	6.93	2,527

Chi-square = 43.599 (Chi-square = 19.68, df = 11, level of significance = .05)

significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 6

There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion. Table 9 presents data on the proportions of recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry into the Navy. The data on the proportions of recruits who scored below the 6.0 RGL are discussed above as percentages for high school graduates and non-high school graduates separately. (See Tables 6 and 7.) An inspection of the relative proportions of the two groups revealed that a somewhat higher proportion (.0105) of the high school graduates than non-high school graduates obtained scores below the 6.0 RGL criterion for the one-year period. In each of the 12 months, the high school graduates had the higher proportion. The confidence limits for the comparison of the difference in the proportions for the composite groups revealed that the overall proportions differ significantly at the .05 level of significance because the limits do not include 0 within the range. The differences were also significant for 4 of the 12 months. In the four months where significant diffferences were observed, the proportions were higher for the high school graduates than the corresponding proportions for the non-high school graduates. The results of comparing the proportions for the two composite groups required rejection of the null hypothesis of no difference in the proportions at the .05 level of significance.

Conclusions

The Navy's recruit population is described in this study based on data for selected variables that apply to the recruits entering the Navy during a

TABLE 9

COMPARISON OF PROPORTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				Confidence Limits
	Yes		No		.025 to .975
Month	N	p	N	p	
June, 1988	7,485	.0433	505	.0416	-.0164 to .0198
July, 1988	8,173	.0388	509	.0334	-.0118 to .0206
August, 1988	8,960	.0411	500	.0400	-.0116 to .0188
September, 1988	8,890	.0381	403	.0298	-.0108 to .0254
October, 1988	4,323	.0412	631	.0254	.0021 to .0295
November, 1988	5,326	.0355	923	.0303	-.0069 to .0173
December, 1988	3,678	.0397	597	.0201	-.0042 to .0434
January, 1989	4,767	.0365	637	.0173	.0059 to .0287
February, 1989	3,230	.0362	433	.0162	.0065 to .0335
March, 1989	2,261	.0389	348	.0259	.0074 to .0444
April, 1989	1,699	.0436	364	.0412	-.0202 to .0250
May, 1989	1,380	.0275	270	.0259	-.0192 to .0224
TOTAL	60,172	.0391	6,120	.0286	.0061 to .0149

12-month time period. The conclusions are derived from the descriptive analyses and the results of testing six hypotheses about specific variables.

With regard to years of education, the typical Navy recruit has completed slightly less than 12 years of education. Nine tenths of the recruits are high school graduates. The inferential analysis on high school graduation status indicates that higher percentages of high school graduates are included among the recruits during some months than other months during the year.

The aptitude of recruits as reflected by means on the AFQT does not appear to vary in any consistent pattern among the recruits with RGL scores below 6.0 or the recruits with RGL scores above 6.0. The means indicate that recruits who score above the 6.0 criterion have greater aptitude than recruits who score below the 6.0 RGL criterion. The difference in the aptitude score means for the two groups suggests that they are dissimilar populations.

The reading comprehension means of recruits exhibit relative stability across the 12-month period, placing the composite group near the 10th grade level. The median for the year places the group near the 12th grade level. The median for the composite group shows a discontinuation of a previous trend toward higher comprehension levels among recruits as reported for four earlier 12-month periods (Bowman & Kerr, 1981; Bowman & Kerr, 1982; Bowman & Kerr, 1983; Kerr, Bowman, & Darcy, 1984) and possibly stabilization as shown for the four immediately preceding 12-month periods (Bowman & Kerr, 1985; Bowman, Kerr, & Webb, 1986; Bowman & Webb, 1987; Bowman, Jones, & Webb, 1988).

The frequency distributions of recruits by RGL categories reveal differences in the composition of the recruit groups when considered by month of entry into the Navy. Separate analyses of the distributions of high school graduate and non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry indicate, however, that differences do not also

exist across the 12-month period for either group. Higher percentages of recruits in neither group tend to score below the 6.0 RGL in any particular consecutive months of the period.

Differences exist in the 12-month distributions of recruits who obtain RGL scores below 6.0 when classified by high school graduation status and month of entry in the Navy. Higher percentages of the recruits who score below the 6.0 RGL are high school graduates in the earlier months of the period. A higher proportion of the composite group of high school graduate recruits score below the 6.0 RGL than is found in the composite group of non-high school graduate recruits.

The findings suggest that the recruit population remains relatively stable, showing little variability during recent years with regard to means on years of education, reading comprehension skills, and aptitude scores. Several variables reveal variability across the 12-month period. Factors for which distributions by month differ include RGL scores, high school graduation status, and high school graduation status of recruits who score below the 6.0 RGL.

This study indicates that the recruits who enter the Navy are likley to vary in different months of the year on some important factors. As a result, ART management personnel need to be prepared for increases and decreases in resource requirements as the recruit population changes throughout the year. By being aware of the variability in demands, more efficient allocation and utilization of the resources can be achieved for ART and the Recruit Training Centers. The study also demonstrates that information is available through the monthly CMI reports on Navy recruit characteristics to improve the effectiveness of program management. Consistent monitoring of these reports and basic analyses of the data would enable the staff to determine the changes occuring

in the composition of the recruit population that affect the ART Program.

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